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Building & Highway Material Testing Laboratory

NABL - Accredited Laboratory as per ISO / IEC-17025 :2005

T-2377

Job No.: CTCE/BBMP/KRIDL/W.No.12/CSR-03/1089a/QB(SDBC)/2015-16 10.03.2016

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

***CUSTOMER**	:	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
***AGENCY**	:	**Technical Manager (West),** KRIDL, Bangalore.
***NAME OF THE WORK**	:	Asphalting to cross and main roads at Kuvempu nagara, Chikkasandra in Ward No.12, Shettyhalli Sub Division, Bangalore.
REFERENCE	:	AEE/SSD/PR/QC/164/2015-16 Dated: 08.02.2016
***SAMPLE ID**	:	Bitumen
DATE OF SAMPLING	:	08.03.2016
DATE OF TESTING	:	10.03.2016

The results of the tests conducted on the bitumen sample.

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	IS :1203 -1978 (RA-2009)	86	80 to 100
2	Softening point, ^{0}C	IS :1205 -1978 (RA-2009)	44	Min. 40
3	Ductility at 27^{0}C, cm	IS :1208 -1978 (RA-2009)	100 >	Min. 75
4	Flash Point, ^{0}C	IS :1209 -1978 (RA-2009)	310	Min. 220

*Information is furnished by the Customer/Representative.

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VISHWANATH. I.A.
Chief Executive Officer

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ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
ಶೆಟ್ಟಿಹಳ್ಳಿ ಉಪವಿಭಾಗ, ದಾಸರಹಳ್ಳಿ ವಲಯ
ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ
ಎಸ್.ಎಂ ರಸ್ತೆ, ರವೀಂದ್ರನಗರ, ಬೆಂಗಳೂರು

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Job No.: CTCE/BBMP/KRIDL/W.No.12/SDBC/AIV/2015-16 10.03.2016

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of the Work	Asphalting to cross and main roads at Kuvempu nagara, Chikkasandra in Ward No.12, Shettyhalli Sub Division, Bangalore.
Reference	AEE/SSD/PR/QC/164/2015-16 Dated: 08.02.2016
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	10.03.2016

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	382	384	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	81	83	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	301	301	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	21.20	21.61	**21.41**

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

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Job No.: CTCE/BBMP/KRIDL/W.No.12/SDBC/Shape_T/2015-16 : 10.03.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	: **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	: **Technical Manager (West),** KRIDL, Bangalore.
Name of Work	: Asphalting to cross and main roads at Kuvempu nagara, Chikkasandra in Ward No.12, Shettyhalli Sub Division, Bangalore.
Reference	: AEE/SSD/PR/QC/164/2015-16 Dated: 08.02.2016
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Semi Dense Bituminous Concrete
Date of Testing	: 10.03.2016

Result : Flakiness Index = **11.62%**

Elongation Index = **13.29%**

Result : Combined Flakiness & Elongation index **24.91%**

Comments:

Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

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Job No.: CTCE/BBMP/KRIDL/W.No.12/SDBC/Stripping/2015-16 11.03.2016

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Customer	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of the work	Asphalting to cross and main roads at Kuvempu nagara, Chikkasandra in Ward No.12, Shettyhalli Sub Division, Bangalore.
Reference	AEE/SSD/PR/QC/164/2015-16 Dated: 08.02.2016
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	11.03.2016

Type of binder : 80/100
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.0 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	2.9	3.13	96.87
2	3.2		
3	3.3		

Comments:

→ Minimum allowable Aggregate retained coating for Semi Dense Bituminous Concrete is 95%

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Job No.: CTCE/BBMP/KRIDL/W.No.12/SDBC/Sp_Wa/2015-16 11.03.2016

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Customer	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of the Work	Asphalting to cross and main roads at Kuvempu nagara, Chikkasandra in Ward No.12, Shettyhalli Sub Division, Bangalore.
Reference	AEE/SSD/PR/QC/164/2015-16 Dated: 08.02.2016
Type of Mix	Semi Dense Bituminous Concrete
Source / Location	Hotmix Plant, Bangalore
Date of Testing	11.03.2016

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2009	2010	2011	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1254	1255	1256	
4	Weight of saturated surface dry aggregate in air	W_3 g	2013	2014	2015	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	759	759	759	
6	Weight of oven dried aggregate	W_4 g	2006	2007	2005	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.643	2.644	2.642	2.643
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.668	2.669	2.677	2.671
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.35%	0.35%	0.50%	0.40%

Comments:

→ Maximum allowable Aggregate Water absorption value for Semi Dense Bituminous Concrete is 2.0%

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Job No.: CTCE/BBMP/KRIDL/W.No.12/SDBC/Stability/2015-16 11.03.2016

TEST REPORT ON STABILITY OF MIX

Customer	:	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	:	**Technical Manager (West),** KRIDL, Bangalore.
Name of the Work	:	Asphalting to cross and main roads at Kuvempu nagara, Chikkasandra in Ward No.12, Shettyhalli Sub Division, Bangalore.
Reference	:	AEE/SSD/PR/QC/164/2015-16 Dated: 08.02.2016
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Semi Dense Bituminous Concrete
Date of Testing	:	11.03.2016

The results of the tests conducted on the Semi Dense Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-16)
1	Marshal Stability, Kn	8.55	8.65	8.2 Kn (min)
2	Marshal flow, mm	3.30	3.50	2 – 4
3	Percent air voids in Mineral Aggregate	3.15	4.25	3 – 5
4	Voids in Compacted Mix	13.15	14.10	13 – 15
5	Percent Voids filled with Bitumen	66.60	67.25	65 - 78
6	Density, g/cc	2.27	2.28	--

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